

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

Cancel Claims 1-39.

40. A method for producing an ultra high molecular weight polyethylene block, comprising:

- (a) crosslinking an ultra high molecular weight polyethylene block having a molecular weight not less than 5 million by irradiating the block with a high energy radiation at a level of at least 1 MR;
- (b) heating said crosslinked block up to a compression deformable temperature below the melting point of the UHMWPE;
- (c) subjecting said heated block to pressure; and then
- (d) cooling said block.

41. A method for producing an ultra high molecular weight polyethylene block according to Claim 40, wherein said irradiation is gamma irradiation at a level of from 1 MR to 5 MR.

Cancel Claim 42.

43. A method for producing an ultra high molecular weight polyethylene block according to Claim 42, wherein said heating is in a range of from 50°C lower than the melting temperature of the crosslinked ultra high molecular weight polyethylene to the melting temperature.

Cancel Claim 44.

45. A method for producing an ultra high molecular weight polyethylene block according to Claim 40, wherein said pressure is applied so as to deform the block.

46. A method for producing an ultra high molecular weight polyethylene block according to Claim 45, wherein said deformation is in a direction perpendicular to the plane of compression.

47. A method for producing an ultra high molecular weight polyethylene block according to Claim 46, wherein said block is cooled in a compression-deformed state under pressure.

48. A method for producing an ultra high molecular weight polyethylene block according to Claim 47, wherein said block has an orientation of crystal planes in a direction parallel to the compression plane.

49. A method for producing an ultra high molecular weight polyethylene block according to Claim 46, wherein said block, after compression, has a thickness of at least 5 mm in a direction perpendicular to the compression plane.

50. A method for producing an ultra high molecular weight polyethylene block according to Claim 46, wherein said block, prior to compression, has a thickness of at least 3 cm.

51. A method for producing an ultra high molecular weight polyethylene block according to Claim 46, wherein said cooled block has a melting point of from 135°C to 155°C.

52. A method of producing an ultra high molecular weight polyethylene block according to Claim 40, wherein after said subjecting to pressure step, said block is subjected to isothermal crystallization.

53. A method for producing an ultra high molecular weight polyethylene block according to Claim 40, wherein after said subjecting to pressure step, said block is subjected to isothermal treatment at a temperature of from 100°C to 130°C for a period of from 1 hour to 20 hours.

Cancel Claims 54-83.

84. A method for producing an ultra high molecular weight polyethylene artificial joint component for implantation in a human or other animal, comprising:

- (a) crosslinking an ultra high molecular weight polyethylene block having a molecular weight not less than 5 million by irradiating the block with a high energy radiation at a level of at least 1 MR;
- (b) heating said crosslinked block up to a compression deformable temperature below the melting point of the UHMWPE;
- (c) subjecting said heated block to pressure; then
- (d) cooling said block; and
- (e) processing said cooled block to form said component.

85. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 84, wherein said irradiation is gamma irradiation at a level of from 1 MR to 5 MR.

Cancel Claim 86.

87. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 86, wherein said heating is in a range of from 50°C lower than the melting temperature of the crosslinked ultra high molecular weight polyethylene to the melting temperature.

Cancel Claim 88.

89. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 84, wherein said pressure is applied so as to deform the block.

90. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 89, wherein said deformation is in a direction perpendicular to the plane of compression.

91. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 90, wherein said block is cooled in a compression-deformed state under pressure.

92. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 91, wherein said block has an orientation of crystal planes in a direction parallel to the compression plane.

93. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 90, wherein said block has a thickness, after compression, of at least 5 mm in a direction perpendicular to the compression plane.

94. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 90, wherein said block, prior to compression, has a thickness of at least 3 cm.

95. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 92, wherein said cooled block has a melting point of from 135°C to 155°C.

96. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 84, wherein said irradiation is conducted in the presence of oxygen.

97. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 84, wherein said irradiation is conducted under a vacuum or in an inert atmosphere.

Cancel Claim 98.

99. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 84, additionally comprising processing said block, after cooling, by a process comprising cutting said block to form said component.

100. A method of producing an ultra high molecular weight polyethylene artificial joint component according to Claim 84, wherein after said subjecting to pressure step, said block is subjected to isothermal crystallization.

101. A method for producing an ultra high molecular weight polyethylene artificial joint component according to Claim 84, wherein after said subjecting to pressure step, said block is subjected to isothermal treatment at a temperature of from around 100°C to 130°C for a period of from 1 hour to 20 hours.

Cancel Claims 102– 136.